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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
KIM, CHONG R	

ART UNIT	PAPER NUMBER
2623	9

DATE MAILED: 02/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/766,238	LAINEMA ET AL.	
	Examiner	Art Unit	
	Charles Kim	2623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-39* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-39* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 April 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *4,5*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. During a telephone conversation with Henry Steckler (Registration No. 24,139) on February 18, 2004 a provisional election was made with traverse on a proposed restriction requirement. However, upon further consideration by the Examiner, the restriction has been withdrawn.

Drawings

2. Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

3. The specification is objected to because it lacks section headings. Appropriate correction is required.

The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

(a) TITLE OF THE INVENTION.
(b) CROSS-REFERENCE TO RELATED APPLICATIONS.

(c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
(d) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC (See 37 CFR 1.52(e)(5) and MPEP 608.05. Computer program listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)), and tables having more than 50 pages of text are permitted to be submitted on compact discs.) or
REFERENCE TO A "MICROFICHE APPENDIX" (See MPEP § 608.05(a). "Microfiche Appendices" were accepted by the Office until March 1, 2001.)
(e) BACKGROUND OF THE INVENTION.
(1) Field of the Invention.
(2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
(f) BRIEF SUMMARY OF THE INVENTION.
(g) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
(h) DETAILED DESCRIPTION OF THE INVENTION.
(i) CLAIM OR CLAIMS (commencing on a separate sheet).
(j) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
(k) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

Claim Objections

The following quotation of 37 CFR § 1.75(a) is the basis of objection:

(a) The specification must conclude with a claim particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention or discovery.

4. Claim 2, 7, 20, are objected to under 37 CFR § 1.75 (a) as failing to particularly point out and distinctly claim the subject matter which the applicant regards as his invention or discovery.

Claim 2 is objected to because the phrase "performed substantially immediately" in line 2 renders the claim ambiguous. More specifically, it is unclear what is meant by "substantially". It appears that the applicant intended the phrase to read "performed immediately". A similar objection applies to claim 20. Appropriate correction is required.

Claim 7 is objected to because of ambiguous claim language. More specifically, the phrase "characterized in that it is determined whether there exists more than one boundary available for filtering, wherein filtering is performed on said more than one boundary available for filtering" is unclear. It appears that the applicant intended the phrase to read "characterized in that it is determined whether there exists more than one boundary available for filtering, wherein if more than one boundary exists, then filtering is performed on said more than one boundary available for filtering". Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-8, 10, 13, 15-16, 19-25, 27, 30, 32, 34, 36, 39 are rejected under 35 U.S.C. 102(e) as being anticipated by Andrew, U.S. Patent No. 6,563,958 ("Andrew").

Referring to claim 1, Andrew discloses a method for reducing visual artifacts in a digital image, which is encoded and decoded by blocks, in which filtering is performed to reduce visual artifacts due to a boundary between a current block and an adjacent block (col. 5, lines 35-52 and figure 3), characterized in that the filtering is performed after the current block is decoded

(decompressed) and there is a boundary available for filtering between the current block and a previously decoded block (col. 5, lines 35-52 and figure 3).

Referring to claim 2 as best understood, Andrew further discloses that the filtering (302) is performed immediately after the current block is decoded (300) and there is a boundary available for filtering (figure 3).

Referring to claim 3, Andrew further discloses that the filtering (302) is performed before all blocks of the digital image are decoded (figure 3. Note that all the blocks are decoded when step 208 is "True").

Referring to claim 4, Andrew further discloses that the blocks are decoded in a certain decoding order (204, 300), characterized in that the filtering is performed before decoding a block later in the decoding order than the current block and adjacent to the current block (figure 3).

Referring to claim 5, Andrew further discloses that the decoding and the filtering of a block are performed sequentially (figure 3).

Referring to claim 6, Andrew further discloses that the filtering is arranged to cause modification of a first number of pixels (x[0], x[1], x[2], x[3]) in the current block and a second number of pixels (x[-4], x[-3], x[-2], x[-1]) in the previously decoded block (col. 4, lines 22-65 and figure 4).

Referring to claim 7 as best understood, Andrew further discloses that it is determined whether there exists more than one boundary available for filtering, wherein if more than one boundary exists, then filtering is performed on said more than one boundary available for filtering (col. 5, lines 35-49).

Referring to claim 8, Andrew further discloses that the filtering is performed in a certain order on the more than one boundary (col. 5, lines 35-49. Note that the two boundaries will be filtered in a certain order).

Referring to claim 10, Andrew further discloses that a pixel value is corrected by filtering, and that the corrected pixel value is used in filtering at least one other boundary [col. 5, lines 6-9 and figure 4. Andrew explains that every vertical boundary is filtered by filtering all the rows across the boundary, and every horizontal boundary is filtered by filtering all the columns across the boundary. Therefore, the horizontal boundary between block (414) and block (402) is filtered by filtering all the columns across the boundary. Note that the pixels in the far right column in block (402) will be corrected by filtering, and subsequently used in filtering the vertical boundary (410) between block (402) and block (404)].

Referring to claim 13, Andrew further discloses that the image is scanned horizontally from top-left to bottom-right (col. 5, lines 41-42).

Referring to claim 15, Andrew further discloses that the image comprises at least one segment of blocks (col. 3, lines 45-48), and that only boundaries between such adjacent blocks which belong to the same segment are filtered (col. 5, lines 68-49).

Referring to claim 16, Andrew further discloses that all blocks within one segment are of the same type (col. 3, lines 44-48).

Referring to claims 19, 34, 36, 39, see the rejection of at least claim 1 above.

Referring to claim 20, see the rejection of at least claim 2 above.

Referring to claim 21, see the rejection of at least claim 3 above.

Referring to claim 22, see the rejection of at least claim 4 above.

Referring to claim 23, see the rejection of at least claim 5 above.

Referring to claim 24, see the rejection of at least claim 7 above.

Referring to claim 25, see the rejection of at least claim 8 above.

Referring to claim 27, see the rejection of at least claim 10 above.

Referring to claim 30, see the rejection of at least claim 13 above.

Referring to claim 32, see the rejection of at least claim 15 above.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 9 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Andrew, U.S. Patent No. 6,563,958 ("Andrew") and Osa, U.S. Patent No. 6,496,605 ("Osa").

Referring to claim 9, Andrew discloses that the filtering is performed during decoding (as noted above), but fails to explicitly disclose that the filtering is performed in the digital image during encoding.

Osa discloses that filtering is performed to reduce visual artifacts due to boundaries between blocks in a digital image during encoding and decoding of the digital image (col. 9, lines 8-35 and figures 8-9). Osa does not explicitly disclose that the order of filtering the

boundaries in decoding is the same as in encoding. However, the Examiner notes that this would have been an obvious feature in Osa, in order to properly decode the encoded image.

Andrew and Osa are both concerned with filtering the block boundaries in a digital image. Osa's method can obtain much more powerful boundary removing performance than conventional boundary filtering techniques (Osa, col. 9, lines 30-35). Therefore, it would have been obvious to combine the teachings of Andrew and Osa, in order to enhance the boundary filtering process.

Referring to claim 26, see the rejection of at least claim 9 above.

7. Claims 11 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Andrew, U.S. Patent No. 6,563,958 ("Andrew") and Nishi, U.S. Patent No. 6,275,533 ("Nishi").

Referring to claim 11, Andrew discloses that the step of filtering is performed after the current block is decoded, wherein a pixel value is corrected by the filtering (col. 4, lines 47-65 and figure 3).

Andrew fails to disclose the step of performing intra prediction of a subsequent block. However, this feature was exceedingly well known in the art. For example, Nishi discloses intra prediction of a subsequent block that is performed after a current block is decoded [col. 24, line 50-col. 25, line 6, and figure 2. Note that the "current block" is decoded in (203) and the intra prediction is performed subsequently in (210)].

Andrew and Nishi are both concerned with coding an image by dividing the image into a plurality of blocks. Nishi's intra prediction method reduces spatially redundant information in

the image, thereby improving the coding efficiency (Nishi, col. 3, line 66-col. 4, line 2). Therefore, it would have been obvious to combine the teachings of Andrew and Nishi, in order to enhance the image coding process. The Examiner notes that the combination of Andrew and Nishi would result in the pixel values being corrected by the filtering method of Andrew, and the corrected pixel values being used in the intra prediction method of Nishi.

Referring to claim 28, see the rejection of at least claim 11 above.

8. Claims 12, 17, 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Andrew, U.S. Patent No. 6,563,958 ("Andrew") and Fukuda et al., U.S. Patent No. 6,434,275 ("Fakuda").

Referring to claim 12, Andrew fails to explicitly disclose that the blocks of the image are grouped into macroblocks. However, this feature was exceedingly well known in the art. For example, Fukuda discloses image blocks that are grouped into macroblocks, wherein the image is scanned macroblock by macroblock (col. 5, lines 23-37 and figure 4).

Andrew and Fukuda are both concerned with filtering the block boundaries in a digital image. Fukuda provides a simple yet stable process for reducing block distortion in which omission of high-frequency components can be eliminated (Fukuda, col. 2, lines 29-40). Therefore, it would have been obvious to modify the image of Andrew so that it is grouped into macroblocks, as taught by Fukuda, in order to enhance the boundary filtering process.

Referring to claim 17, Andrew fails to explicitly disclose that the image comprises luminance and chrominance components. However, this feature was exceedingly well known in the art. For example, Fukuda discloses an image that comprises luminance and chrominance

components, wherein filtering is performed to reduce visual artifacts due to a boundary between a current block and an adjacent block in the luminance component (col. 26, lines 34-65 and figure 25).

Andrew and Fukuda are both concerned with filtering the block boundaries in a digital image. Fukuda provides a simple yet stable process for reducing block distortion in which omission of high-frequency components can be eliminated (Fukuda, col. 2, lines 29-40). Therefore, it would have been obvious to modify the method of Andrew so that it includes the teachings of Fukuda, in order to enhance the boundary filtering process.

Referring to claim 29, see the rejection of at least claim 12 above.

9. Claims 14, 31, 33, 35, 37-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Andrew, U.S. Patent No. 6,563,958 ("Andrew").

Referring to claim 14, Andrew discloses filtering the boundary to the left of the current block and the boundary to the top of the current block (col. 5, lines 35-49). However, Andrew fails to explicitly disclose that the filtering order is selected such that a boundary to the left of the current block is filtered before a boundary to the top of the current block. The Examiner notes that the specific filtering order is not considered a patentable distinction, since it would have been chosen by the user during experimentation in order to meet his/her specific requirements. Therefore, it would have been obvious to modify Andrew's teaching so that the boundary to the left of the current block is filtered before a boundary to the top of the current block is filtered, since no new or unexpected results are seen to be attained by that specific filtering order.

Referring to claim 31, see the rejection of at least claim 14 above.

Referring to claims 33, 35, 37-38, see the discussion of at least claim 34 above. Andrew explains that the image is encoded as noted above, but fails to explicitly disclose an encoder for locally decoding the digital image and filtering the artifacts due to boundaries. However, the Examiner notes that this would have been an obvious feature in Andrew's system, in order to reduce the visual artifacts before the image is transmitted (see col. 6, lines 20-25), thereby providing an enhanced image to the receiver/decoder.

10. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Andrew, U.S. Patent No. 6,563,958 ("Andrew") and Zhou, U.S. Patent No. 6,236,764 ("Zhou").

Referring to claim 18, Andrew fails to explicitly disclose that the image comprises at least a first color component and a second color component. However, this feature was exceedingly well known in the art. For example, Zhou discloses an image that comprises at least a first color component (CB) and a second color component (CR), wherein filtering is performed to reduce visual artifacts due to a boundary between a current block and an adjacent block in the first color component (col. 8, lines 10-49 and step 110 in figure 5).

Andrew and Zhou are both concerned with filtering the block boundaries in a digital image. Zhou provides a relatively simple yet accurate boundary filtering algorithm that is fast enough for real-time applications (Zhou, col. 8, line 59-col. 9, line 5). Therefore, it would have been obvious to modify the method of Andrew so that it includes the teachings of Zhou, in order to enhance the boundary filtering process.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles Kim whose telephone number is 703-306-4038. The examiner can normally be reached on Mon thru Thurs 8:30am to 6pm and alternating Fri 9:30am to 6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on 703-308-6604. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ck
February 8, 2004

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